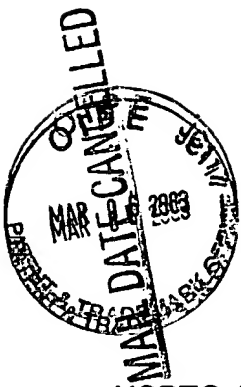


3-10-03

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5/13 (HE)
J. Steptoe
3-18-03

Charles S. Vann
1425 Drake Avenue
Burlingame, CA 94010
Tel: 650 375 1136

USPTO, Washington DC, 20231
March 4, 2003

Dear Mr. Hien Vo:

I am replying to office communication mailed February 20, 2003 on Patent Application 09/893,952, dated June 28, 2001 and titled "Orientation and Position Sensor".

Action 1: Claims are rewritten to replace claims 4-7 as follows:

8. A position and orientation sensor, comprising:

an alignment target having a first optical feature a fixed distance from a
second optical feature;

an imaging device that can form an optical image of said alignment target with
said first feature in focus and said second feature out of focus;

whereby the location and size of said first feature compared to the location and
size of said second feature in said optical image are measurements of up to
three orthogonal positions and up to three orthogonal orientations of said
alignment target with respect to said imaging device

9. The sensor of claim 1 wherein one or more of said features is a cross hair.

10. The sensor of claim 1 wherein said imaging device comprises a lens and a
transparent projection screen.

11. The sensor of claim 1 wherein said imaging device is a camera.

12. The sensor of claim 1 further including a monitor connected to said imaging
device.

13. The sensor of claim 1 further including a computer connected to said
imaging device.

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Action 2: I have examined the patent by Grimson et al. (5,531,520) and determined that it does not anticipate this invention for the following reasons.

Grimson's invention has more elements. It requires collection and storage of two or more (in-practice many) camera images at different locations on an object in order to construct a three-dimensional map of that object. Either the object or camera must move (scan) to implement that strategy. Furthermore, for Grimson's invention to sense position and orientation of an object, a means for registering, compiling, and storing multiple image data sets (i.e. a computer and software) into a three dimensional map of the object is required along with a video camera for detecting alignment of the real-time image relative to the three dimensional map of the object. Thus, to sense position and orientation of an object, Grimson's invention discloses a laser stripping device, a laser camera, a real-time video camera, and an image data registration system (i.e. computer and software).

My invention is much simpler. It needs only one image to sense position and orientation of an object, avoiding scanning and data storage, and needs only an alignment target and an imaging device as simple as a lens and a transparent projection screen.

Conditional request for constructive assistance

If for any reason this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of the examiner pursuant to M.P.E.P. & 2173.02 and 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Sincerely,

A handwritten signature in cursive script, reading "Charles S. Vann".

Charles S. Vann